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10/069,393	02/26/2002	Graham Louis Wilson	146381.00003	3601

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1501 K Street N.W.
Washington, DC 20005

EXAMINER

KERNS, KEVIN P

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 08/01/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,393

Applicant(s)

WILSON, GRAHAM LOUIS

Examiner

Kevin P. Kerns

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-20 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group II (claims 13-20) in Paper No. 8 is acknowledged. The traversal is on the ground(s) that the sprue insert-set is allegedly closely related to the hot-chamber diecasting process and die-set for use in the diecasting process. This is not found persuasive because the sprue insert-set (see Figure 3, tubular sprue body "150" and sprue tip insert "152") contains no common technical feature with either the hot-chamber diecasting process (best shown in the "Prior Art" of Figure 1) or the die-set for use in the diecasting process (see the die assemblies of Figures 2, 3, and 7, as well as die insert "130" of Figure 3 and die inserts "250" and "252" of Figure 7). From these drawings in particular, it is clear that the die inserts are separate entities from the sprue inserts, and are thereby independent and distinct as claimed. Due to the independent and distinct claims set forth above, an increased search burden would be required without a restriction requirement, as the inventions lack unity (no common technical features).

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "140" (should be in Figures 2-4 -- see abstract) and "254" (should be in Figure 7 -- see abstract and specification, page 10). A proposed drawing correction or

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corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "164" of Figure 5. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The abstract of the disclosure is objected to because several of the reference numbers cited are incorrect. For example, "130" should be changed to "150"; "136"

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should be "156"; "132" should be "152"; and "155" should be "115". Correction is required. See MPEP § 608.01(b).

Claim Objections

6. Claim 20 is objected to because of the following informalities: in the 3rd line of the claim, "second" should be changed to "tip".

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 13, the claim limitations "tubular sprue body insert", "said body insert", "said sprue insert", "the sprue insert", "the body insert", and "the said insert" are all used (intended to be interchangeably?) in this claim, but it is unclear whether all of these limitations refer specifically to reference numbers "150" and "258" (Figures 3 and 7, respectively), or if the "sprue tip insert" (reference numbers "152" and "266" of Figures 3 and 7, respectively) was also intended to be claimed by one or more of these (unclear) limitations. If not, the "sprue insert-set" as claimed in the preamble is incomplete without both the "tubular sprue body insert" and the "sprue tip insert".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 13, 14, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perrella et al. (US 5,379,827) in view of Steinman et al. (US 3,137,904).

Perrella et al. disclose a die casting machine that includes fixed and movable dies (100,101), in addition to a plurality of inserts (106,113,114) that define a tapering, tubular sprue/runner 111 having a (tapering, approximately 45 degree angle) configuration that causes increased (molten metal) flow velocity closer to the die cavity 112, such that a parting line 102 defines mating surfaces between the die portions as well as the first and second curved grooves of the sprue/runner 111 cavity defined by

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the plurality of inserts (106,113,114), all of which further define a curved transition channel along the parting line 102 when the dies are closed (abstract; column 3, lines 4-29; column 4, lines 35-46; column 9, lines 64-68; column 10, lines 1-51; and Figure 6). Perrella et al. do not disclose the use of heating means that heat the insert, a sprue tip insert, and cooling means associated with the sprue tip insert.

However, Steinman et al. disclose a sprue bush mounting for die casting machines, in which the die casting machine includes fixed and movable dies (19,28), a tubular sprue insert (water-jacketed sprue bushing 13) mounted within the fixed die 19, a sprue tip insert (sprue spreader 31) mounted within the movable die 28, such that the sprue spreader 31 has ejector pins 32 that serve as a heat sink (a form of cooling means) associated with it, as well as a water cooling means 18, and a heat source (flame nozzles 27) that serves to heat the nozzle/sprue bushing interface (column 1, lines 10-14, 27-30, and 50-71; column 2, lines 1-69; and Figures 1-4). The heating means, sprue tip insert, and cooling means are advantageous for avoiding freeze-up of metal in the vicinity of the nozzle/sprue bushing interface, for cooperating with the sprue bushing while having an ejector assembly for removing the cast product, and for reducing the temperature, thus avoiding metal expansion and distortion in the critical interface regions within the die casting assembly, respectively (column 1, lines 27-30; and column 2, lines 10-29 and 61-69).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the die casting machine having a plurality of inserts that define a tapering, tubular sprue/runner, as disclosed by Perrella et al., by

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adding the sprue body insert heating means, a sprue tip insert, and sprue tip insert cooling means, as taught by Steinman et al., in order to avoid freeze-up of metal in the vicinity of the nozzle/sprue bushing interface, to cooperate with the sprue bushing while having an ejector assembly for removing the cast product, and to reduce the temperature, thus avoiding metal expansion and distortion in the critical interface regions within the die casting assembly, respectively (Steinman et al.; column 1, lines 27-30; and column 2, lines 10-29 and 61-69).

12. Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perrella et al. (US 5,379,827) in view of Steinman et al. (US 3,137,904) as applied to claim 13 above, and further in view of Putkowski (US 3,677,682).

Perrella et al. (in view of Steinman et al.) disclose and/or suggest the features of claim 13 above. Neither Perrella et al. nor Steinman et al. discloses the 90 degree angle of the curved groove within the sprue insert, as well as thermal insulation around the heating means of the sprue insert.

However, Putkowski discloses a hot runner system for an injection molding apparatus, in which the sprue/runner system includes a surrounding tubular member 30 provided with heaters (40,42,141) and associated ceramic insulation (44,150), as well as a 90 degree angle extending from the sprue bushing 16 through channel 18, and further extending around a 90 degree bend 38 before subsequent injection through tapered passage 50 into mold cavity 6 (abstract; column 1, lines 27-53; column 2, lines 27-75; column 3, lines 1-45; column 6, lines 38-75; column 7, lines 1-38; and Figures 1,

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11, and 12). The 90 degree curved groove angle and the thermal insulation around the heating means are advantageous for reducing turbulent flow of the melt while maintaining a more uniform temperature within the sprue/runner assembly surrounding the flow to the die cavity (column 1, lines 27-53; column 2, lines 54-63; and column 6, lines 47-75).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the die casting machine having a plurality of inserts that define a tapering, tubular sprue/runner, as disclosed by Perrella et al., by adding the sprue body insert heating means, a sprue tip insert, and sprue tip insert cooling means, as taught by Steinman et al., and by further adding the 90 degree curved groove angle and the thermal insulation around the heating means, as taught by Putkowski, in order to reduce turbulent flow of the melt while maintaining a more uniform temperature within the sprue/runner assembly surrounding the flow to the die cavity (Putkowski; column 1, lines 27-53; column 2, lines 54-63; and column 6, lines 47-75).

13. Claims 16 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perrella et al. (US 5,379,827) in view of Steinman et al. (US 3,137,904) as applied to claim 13 above, and further in view of Whitehorn (US 4,638,849).

Perrella et al. (in view of Steinman et al.) disclose and/or suggest the features of claim 13 above. Neither Perrella et al. nor Steinman et al. discloses a temperature sensor means in combination with thermal insulation in a sprue assembly.

However, Whitehorn discloses a nozzle assembly for a die casting apparatus, in which the nozzle (which is a portion, or insert, adjacent a sprue bushing 26) includes a plurality of heating elements (adjacent thermal insulation), a series of thermocouples (104,108,112), and an associated temperature control unit, the combination of which is advantageous for precise sensing and control of temperature to extend the operational life of the nozzle assembly and improve casting quality (abstract; column 1, lines 35-66; column 2, lines 35-68; column 3, lines 1-68; column 4, lines 1-34; column 5, lines 38-68; column 6, lines 1-17; and Figures 1-4).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the die casting machine having a plurality of inserts that define a tapering, tubular sprue/runner, as disclosed by Perrella et al., by adding the sprue body insert heating means, a sprue tip insert, and sprue tip insert cooling means, as taught by Steinman et al., and by further adding the combination of a plurality of heating elements, a series of thermocouples (104,108,112), and an associated temperature control unit, in order to precisely sense and control temperature to extend the operational life of the nozzle assembly and improve casting quality (Whitehorn; column 1, lines 35-41; column 5, lines 38-68; and column 6, lines 1-17).

Conclusion


14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Valyi and Cross references are also cited to show related art.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (703) 305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KPK
kpk
July 20, 2003


M. ALEXANDRA ELVE
PRIMARY EXAMINER